BLUEGRASS 99 COMPUTER SOCIETY, INC.

Heart of the Bluegrass

BYTEMONGER

LEXINGTON, KENTUCKY

MARCH 1988

MEETING NOTES

by WESLEY R. RICHARDSON

The March meeting of the BLUEGRASS 99 COMPUTER SOCIETY, INC. will be held on Thursday, March 3, 1988, beginning at 7:00 P.M. at the KENTUCKY UTILITIES OPERATIONS CENTER, 500 Stone Road, Lexington, Kentucky. The library will open at 6:30 P.M. and will be open again during the break and after the meeting.

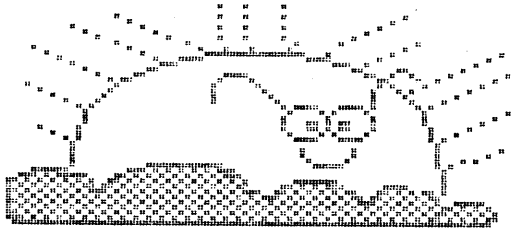
FRACTAL VIDEO

Don Mac Clellan will present a 30 minute video of FRACTALS. Many members will remember his last presentation of FRACTAL slides and the variety of colors, shapes and patterns. Art Matrix, at the Cornell National Supercomputer Facility, created the video as a research work. The purpose is to provide scientific observation to people who are seriously interested in the nature of fractals. Art Matrix has fractal pictures and literature available in slides, postcards, prints and videos. Art Matrix may be contacted at:

ART MATRIX
PO 880
ITHACA, NY 14851-0880
607-277-0959 (24 HOURS/DAY)

HARDWARE MODIFICATIONS

If you have always wanted to see inside your TI-99/4A console, but were afraid to open it, come to the March 3 Bluegrass 99 Computer Society meeting. Bob Krause will demonstrate the NMQ modulator which offers improved TV screen images. He will also open a console and show which resistor can be changed to 330 ohm for improved picture sharpness. Bob will also talk about adding 32k/64k of memory inside your console.



LIMA CONFERENCE

The Lima Ohio User Group is having a MULTI USER GROUP CONFERENCE and SWAP MEET on the Lima Campus of Ohio State University. The event is SATURDAY MAY 21, 1988 from 8 AM to 6 PM. There is no admission charge or exhibition charge. The Lima Campus of O.S.U. is jest east of Lima on state route 309. Exit I-75 at route 309 and go 2 miles east on 309. Turn left (north) at the sign onto Mumaugh Road. The campus entrance is 0.5 miles north of this intersection on the right. The meeting is in the Student Activity Building. For more information contact:

LIMA AREA TI-99/4A USER GROUP
C/O DAVE SZIPPL
4 POULSTON PLACE
LIMA, OH 45805
419-228-7109

ENVELOPE

Bradford Hearn, author of ENVELOPE has written our group requesting support and feedback for his fairware program. ENVELOPE version 1.# will read a letter in a TI-Writer file, locate the addressee, and print the address on an envelope. The disk copy price is $5.00 and your disk with a pre-paid mailer or send $6.00. You can contact him at:

BRADFORD HEARN
914 W. BERTRAND
HOUSTON, TX 77088

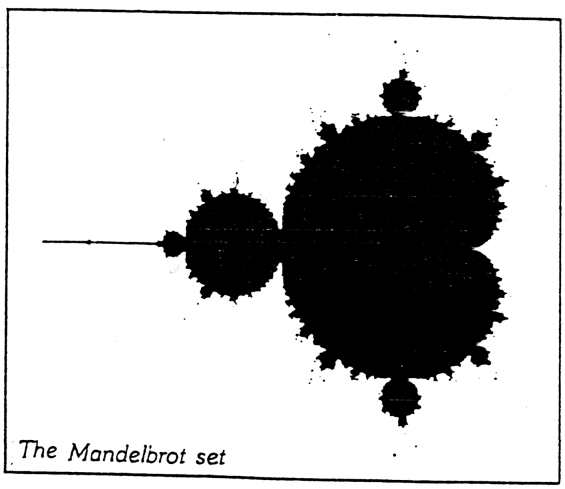
FRACTALS: A new

By Don MacClellan

In 1975 Benoit B. Mandelbrot coined the term 'Fractal' to describe fractional dimension images he was studying. Mandelbrot's investigations into this long neglected field of mathematics have opened the way to a greater understanding of natural phenomena in what has developed into a field of Chaos and Stability in dynamic systems. For over 350 years we have had to depend upon Galileo, Newton & Euclidian geometry to explain the physical world. Mandelbrot wondered:

> "Why is geometry often described as cold and dry ? One reason lies in its inability to describe the shape of a cloud, a mountain, a coastline, or a tree. Clouds are not spheres, mountains are not cones, coastlines are not circles, and bark is not smooth, nor does lightning travel in a straight line.....Nature exhibits not simply a higher degree but an altogether different level of complexity. The number of distinct scales of length in patterns is for all purposes infinite."

Two French mathematicians, Pierre Fatou and Gaston Julia, investigated iteration in the complex plane in the 1920's. Because of the thousands of calculations required, little more was done for over 50 years, and it took the computer age to make possible multiple iteration of functions containing imaginary numbers.



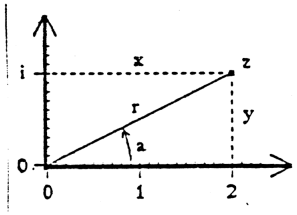
The Mandelbrot set

We will be looking at the Mandelbrodt Set, a group of fractional dimension curves created by performing a iterative process on complex numbers.

Both the Mandelbrot set as well as the Julia Set (named after Gaston Julia) produce beautiful, colorful curling & and twisting shapes which, upon magnification, lose none of their resolution. Instead, variations upon the shape of the original Mandelbrot set appear as specks and as we zoom in grow into a swirl of color, sometimes symmetrical and at other times diminishing into tiny interconnecting threads.

While the Mandelbrot set appears continuous, the multitude of Julia sets appear as isolated swirls and patterns inside and outside of the Mandelbrot set.

A complex number such as Z = 4 + 5i is composed of a real number [4] and a imaginary number [5i]. i is defined mathematically to be -1. In the real world, negative numbers do not have square roots, hence, Z+4+5i is an imaginary line. Each point/complex number has four properties: a real part, an imaginary part, a modulus, and an argument. For the point z shown in the picture, the real part is x=2, the imaginary part is y=1, the modulus is r= 3, and the argument is a=arctan 1/2.



The process which the computer is performing is in effect self-squaring; adding a constant (another complex number), and using the resulting value to start over again. When the number reaches a value of 2, the number of iterations required to reach 2 is determined, and a color assigned and displayed for that point on the complex plane. If the number Z never reaches 2, then the color is black. The number of calculations necessary to reach 2 (the set point) determines the 'life' of a point which is then assigned a color.

geometry of life

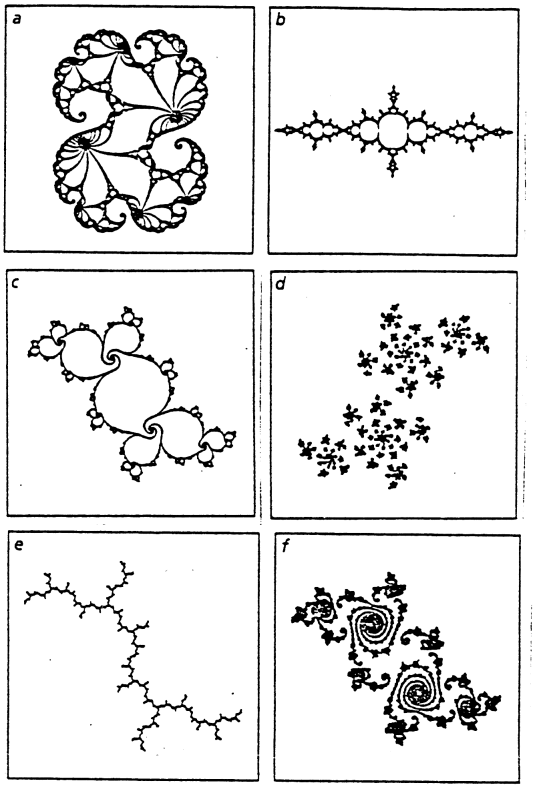
$$z \mapsto z^2 + c$$

For the TI-99/4A home computer, calculation and display of a 254 x 192 pixel fractal image would be much too time consuming. By using the multi-color mode where each point is 4 x 4 pixels, a 64 x 48 point fractal image can be calculated and displayed in about 2 hours. Many boundry images take less time. All 16 colors are available to display the 'life' of each calculated point.

The video tape of fractal images in the Mandelbrot Set which you will see at the meeting contains zooms to magnify the colorful boundary. Each scene contains 1000-1500 image frames displayed at 30 video frames per second. Each one of the images takes from 30 seconds to 10 minutes to compute on a FPS 264 array processor at 8,000,000 floating point operations per second.

Homer W. Smith, President of ART MATRIX, who produced the video considers Fractals an important key to life: "Fractal math is a way of looking at equations and physical phenomena, just as Calculus is a way of looking at equations and physical phenomena. Calculus deals with related rates. Fractals deal with insides and outsides. Fractal math is the most important discovery since Calculus. Calculus is important to all of life. So are Fractals. What in existence does not have to do with related rates? - or with insides and outsides? Fractal math has to do with any system of insides trying to survive in a system of outsides. Even a hurricane depends on and feeds upon the surrounding atmosphere where there is no hurricane. Fractals are a description of whether or not insides survive in various outsides of interest. From that point of view, they underlie every operating system in existance.

In January of last year, Wes Richardson presented a demonstration of a Fractal program written by Steve Langguth which develops color images of mathematical functions of imaginary numbers. Wes was successful in reducing the run time for a Fractal image by working with the floating point routines, but the time required with limited memory is still about two hours. That program is available in our library.



Six Julia sets, some connected (a, b, c *and* e) *and some not* (d *and* f)

Later, we saw numerous color slides of fractional dimension iterations which were produced at Cornell University's National Supercomputer Facility. These slides were taken of 483 x 512 pixel images produced from about 250,000,000 calculations compared to TI's 307,200.

We should recognize that the dramatic color video zooms which we see at this Society meeting are only an entertaining introduction to a profound new field of mathematics; a new tool to help explain biological phenomena such as branching and root systems, geological upthrusts, dikes and crust interfaces, fluid flow in multiviscous systems, music systems and sound, weather and a multitude of heretofore unexplained phemonea in dynamic systems - both mechanical, fluid and electrical. If none of these areas turn you on - they are one of the most dramatic and colorful art forms since the Renaissance.

COUNT 99999 UPDATE

by WESLEY R. RICHARDSON
BLUEGRASS 99 COMPUTER SOCIETY, INC.

Stephen Shaw of the U.K. TI Users Group in Stockport, England wrote that he could not believe the slow timing for PASCAL, so he tried COUNT 99999 in TURBO PASC 99. He found that TURBO PASC 99 took only 7.5 percent of the time that PASCAL did to count to 99,999. The source code is very similar, with the main difference being that PASCAL uses GOTOXY(COLUMN,ROW) while TURBO PASC 99 uses CURSOR(ROW,COLUMN) to locate the character for printing to the screen.

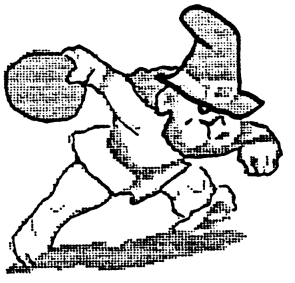
In a comparison of standard benchmarks of computer speed, such as INTMATH, REALMATH, TRIGLOG, TEXTSCRN, GRAFSCRN, and STORE, Stephen Shaw has found that TURBO PASC 99 usually runs faster than PILOT 99, MYARC XB, TI BASIC, and TI XB. His data, as well as the COUNT 99999 data show that c99, FORTH, and TURBO PASC 99 all run in similar times. Stephen Shaw's conclusions, which I agree with are that while one language may be fast at one thing, inevitably another language is fast at another. Some languages are easier to use than others, and some can do things others cannot.

Below is an updated comparison of the nine languages that have run COUNT 99999.

LANGUAGE	COUNT 99999 RUN TIME	RATIO
BASIC	1 HR 51 MIN 39.4 SEC	295.1
99 FORTRAN	0 HR 55 MIN 21.9 SEC	146.3
XBASIC	0 HR 44 MIN 13.1 SEC	116.9
PASCAL	0 HR 37 MIN 32.5 SEC	99.2
LOGO	0 HR 35 MIN 28.8 SEC	93.8
TURBO PASC	0 HR 02 MIN 48.0 SEC	7.4
FORTH	0 HR 01 MIN 36.5 SEC	4.3
c99	0 HR 01 MIN 28.0 SEC	3.9
ASSEMBLY	0 HR 00 MIN 22.7 SEC	1.0

```
{ COUNT 99999-T  TP99                    }
{ TURBO PASC 99 - Texaments              }
{ Stephen J. Shaw, U.K. TI Users Group   }
{ January, 1988                          }
{ TP99 run time 2 min 48.Ø sec           }

PROGRAM count;
LABEL exit;
VAR v,w,x,y,z : INTEGER;
    k : STRING[1];
BEGIN
cls;
k:="Y";
WHILE (k="Y")  DO
  BEGIN
  cursor(16,11);
  write(chr(67));
  write(chr(79));
  write(chr(85));
  write(chr(78));
  write(chr(84));
  write(chr(32));
  write(chr(63));
  write(chr(32));
  write(chr(89));
  write(chr(78));
  read(k);
  IF k<>"Y" THEN GOTO exit;
  cls;
  cursor(12,15);
  write(chr(44));
  FOR v:=48 TO 57 DO
    BEGIN
    cursor(12,13);
    write(chr(v));
    FOR w:=48 TO 57 DO
      BEGIN
      cursor(12,14);
      write(chr(w));
      FOR x:=48 TO 57 DO
        BEGIN
        cursor(12,16);
        write(chr(x));
        FOR y:=48 TO 57 DO
          BEGIN
          cursor(12,17);
          write(chr(y));
          FOR z:=48 TO 57 DO
            BEGIN
            cursor(12,18);
            write(chr(z));
            END;
          END;
        END;
      END;
    END;
  END;
exit:
END.
```



RAMBLINGS OF AN IDLE MIND

By Bob Krause
BLUEGRASS 99 COMPUTER SOCIETY, INC.

MY WISH-LIST FOR SOFT-WARE UP-GRADES

Former club president Mark Armstrong has been collecting new software ideas with the hope that one or more of them may become reality through the efforts of some skilled TI programmers(s). In the spirit of Mark's search for this 'software Holy Grail', I'd like to offer a few suggestions. If you are also inclined toward this kind of brain-storming , give your ideas to Mark or myself. Since the *BYTEMONGER* is widely read in the TI World, maybe some of your ideas will bear unexpected fruit. With that said and without further ado, here is my wish list:

1. An automatic "SAVE FILE" feature for Funnel Writer. This feature would automatically save to file every minute or so, even as the writer is writing. Set up properly it could also do alternating "SAVES" to a back-up disk.

2. A feature for Funnel Writer, and for Multi-plan which would allow the use of a light-pen to move the cursor. You could move the cursor over a number or letter that you want changed, and then eefect the change from the key-board.

3. A printer code and formatter command file that could be pulled up from the command line mode in Funnel Writer, similar to "SHOW DIRECTORY". Those of us who use a fairly extensive printer code and formatter command set could mark those features we want to include for the particular text file that we are working on, and they would be included at the top of the file upon hitting "Enter".

4. A way to have ready Funnel Writer access to all of the higher number A.S.C.I.I. character sets, without sacrificing the key-board to transliteration commands which have to be commanded to turn on and off. Perhaps this could be done with a light pen. In our imaginary program, the light pen would do the transliterating on the screen. For instance, if you wanted an intricate border or design in a text file, as well as text, you would transliterate to the light pen. Give the light pen an A.S.C.I.I. code, and let it put the desired effect on the screen; give it another code, and do more of the same. By establishing the design character within the text file, instead of handling it as a transliterated printer command, the full key board is freed for other purposes. Much less effort would be expended to get a creative effect. While the embedding of design characters in screen text is possible with "Print to File", it is relatively awkward and inflexible, compared to what it should be. Having a simple tool like this proposed program, tied to a low-cost, low technology light pen, would open up Funnel Writer for all kinds of grapic integration that is not done by most users today.

5. In the same vein as the "Show Directory", file, or the Printer code and formatter command file discussed above, is a CSGD font or artwork file which could be loaded up with a favorite CSGD font. After accessing the font set from the command line of Funnel Writer, you could mark a letter or letter set and then incorporate it into the text by hitting "Enter." Speaking from experience, most newsletter editors get into the habit of using only one or two fonts regularly. If there was a Funnel Writer patch like this, newletter publishing would be a snap.

6. An automatic "Include File" which could be accessed through "Show Directory". One would give an "Include File" pre-command on the "Show Directory" screen, and mark those files to be included in a printing through formatter. This would speed the process of preparing large batches of files for printing.

7. Error Code flashes that actually said what was wrong, instead of just giving a number to look up.

8. A "Help" Command for Funnel Writer, similar to that found in Multi-plan. A variety of good tid/bits might be stored here, and perhaps brought up from disk when the command was implemented.

9. An easy incorporation of some spell-checker program into Funnel writer which could handle large files. My experience with a spell-checker known as Dragon Slayer is that it starts "stacking" with only a page or so of text in the memory. When it is "stacked" it won't check all the words. Perhaps a utility could be built into Funnel Writer which would automatically break the text file into small elements for the sole purpose of spell-checking at the point of a stack and then automatically reconstituting the file when spell checking was complete. This would greatly improve the value and ease of the spell-checking function.

10. A way to print money, so that I could get all the toys for my T.I. that I wanted.

There! That's my contribution. Now yours.

WHILE WE'RE AT IT, HOW ABOUT A POSTER

Being a columnist for the *BYTEMONGER* gives me the luxury of talking about what ought to be done, without actually having to do it. As Mark Twain once said, "To be

good is noble. To tell people how to be good is even nobler, and much less trouble."

In this vein, I've been thinking about putting together an 8 1/2" by 11" poster for the newsletter that people could stick in grocery stores and on church bulletin boards in order to get new members. Problem is: I haven't done it. Let's have a contest and get it done. I will give a $10 dollar prize out of my own pocket to the member who designs the best T.I./Bluegrass Computer Society Poster. The poster should be simple, with nice graphics, and be easy to duplicate; but most importantly, it should tell how people can get involved with us at the Bluegrass Computer Society. Judging will be by a vote of the membership at the April meeting. Get your Poster to me as soon as possible (or even bring it along to the April meeting), and then you, too, can tell people how to be "noble".

MORE FOR THE HARDWARE STUDENT

RAM is an acronym for Random Access Memory. This is the operating programmable computer memory. There are two kinds of RAM -- dynamic RAM (also called DRAM) and static RAM (also called SRAM). The chips in the video display processor inside the console, for example, are DRAM, as are the chips in the 32 K memory expansion. The MYARC memory expansion card (not battery-backed) is also DRAM. DRAM is called dynamic RAM because the memory has to be refreshed periodically. The "refreshing" application is obvious in the video display of the TI-99/4A where signals are constantly sent to the screen for viewing. This refreshing activity requires the machine to be operating in order to maintain the data. Static RAM keeps its data as long as power is supplied. All battery-backed cards, such as the Horizon RAM Disk, utilize static RAM chips. The T.I. console has some SRAM which is used for the operating system of the machine.

A different kind of memory is the ROM (Read Only Memory). As an example, cartridges or command modules are built with ROM chips and part of the operating system for the T.I. is stored on ROM, although they are also found elsewhere. EPROM stands for Eraseable Programmable Read Only Memory. GROM means Graphics Read Only Memory. More will come next month.

ARTICLE APPEAL

by Doris Settles
EDITOR, *Bytemonger*

I am a firm believer in involving everyone that can possibly contribute. To this end, I am including the formatting codes that will enable you to print out articles for the newsletter. If you have an Epson or compatible printer, that is.

APPALACHIAN COMPUTER SUPPLIES DIVISION

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Now I know that all that has been stopping you from contributing your TIdbits has been a lack of comprehension of those nasty, confusing things called *TRANSLITERATION CODES*. Well, now you have no excuse. And I expect to be deluged next month with an outpouring of paper and disks full of all sorts of interesting comments, humor, and info for our TI community. GO TO IT!

```
.CO BYTEMONGER FORMAT HEAD
.FI
.AD
.LM 6
.RM 64
.PL 64
.CO CONDENSED TYPE(15),
.CO DOUBLE-STRIKE (27,71),
.CO 1/6 LINE(27,50) SPACING !!
.TL 126:15,27,71,27,50
.CO FRONT BRACKET ([) TO VERT BAR
.TL 91:233
.CO BACK BRACKET (]) TO HORIZ BAR
.TL 93:231
.CO LEAN LEFT SLASH TO DIAMOND
.TL 92:174
.CO Italicize transliteration "{" "}"
.TL 123:27,52
.TL 125:27,53
.CO Subscript transliteration "<" ">"
.TL 60:27,83,0
.TL 62:27,84
.IN +5
~
```

POOR PERSONS AB SWITCH

by Dallas Phillips

This article was written for Kentuckiana TIdbits and the Bluegrass Bytemonger newsletters. It first appeared in the January '88 issue of TIdbits.

Several people have told me they would like to construct their own AB switches. This article may be the answer.

An AB switch simply switches something from position A to position B. It doesn't get any simpler than that. Away back in BC (Before Computers) they were called transfer switches.

Most computer AB switches are designed to enable you to use two computers with one printer or one computer with two printers, without unplugging and re-connecting them every time you change. They are available with either Sub-D serial or with Centronics parallel connectors. One problem with the commercial units is that they have all female connectors so you still have to purchase or assemble, at least, two expensive cables. Another problem, for people like me, is that they normally sell for some figure between $95.00 and $45.00. If you just buy the switch and two "PIO" cables you could pay up to $150.00 but, to be honest, there are places that sell the AB switch for $22.50 and the cables for $12.00 each, plus tax and shipping. ABC switches are also available, if you need them.

If you need to switch two computers to a single printer you will do well to buy a factory assembled unit. No home computer or printer uses all 36 connections but different computers and different printers use different pins so all 36 pins are switched to avoid any mixup. If you switch all pins you must use a 36 circuit two position switch or equal. Of course, by doing a little research and custom building a unit that may work only with your setup you can get by for quite a bit less but the components will usually cost considerably more than one of the lowest priced commercial units.

ONE COMPUTER to TWO PRINTERS

If you need to switch one computer to two printers the story is entirely different. ANOTHER TI-99/4A ADVANTAGE is that, if you are using one TI computer and any number of parallel printers they can be switched with a two pole switch! The reason is that the TI only uses the BUSY signal, from the printer, as its Handshake IN. It does not need an ACK signal. The strobe line, the eight data lines and the ground do not need to be switched, they can be wired in parallel. We must switch the BUSY signal line and we cannot mix the +5V pull up signals so, if either of your printers need the pull-up voltage, we must switch that line too. All it takes, for AB switching, is a DPDT switch!

If all parts are purchased, new and you use your present printer cable to come from the RS-232 connector, you should be able to build this professional looking set-up for under $20.00, including the cables to both printers and almost everything can be bought at Radio Shack. If you have ever built any other electronic devices you will probably have some of the "stuff" so you will not have to buy all of the parts listed here.

CONSTRUCTION

Start by obtaining all of your components. There is nothing worse than cutting a case to fit parts that are different from the ones you cut and drilled for. Do your layout with a grease pencil or sharp crayon. Center punch all holes then drill all holes with the 3/16" bit, first. The switch hole should be in the center of the front. The screw holes are evenly spaced across the bottom but they should be positioned so your terminal strips will be located to the rear, to allow sufficient room for the switch. The three holes for the cables should be evenly spaced across the back. See Figure 2. Exact spacing dimensions are not given because your components may be different from the ones I used.

When the holes are drilled, insert the grommets and mount the terminal strips. Mount the switch, turned across the case, not up and down. See Figure 1. NOTE: Do not attempt to wire by Figure 1. It is a pictoral that was drawn only to show positioning of components and general routing of the wiring.

The schematic is shown in Figure 3. It should be readable but the connections are also listed here. NOTE: A FEW PRINTERS HAVE SOME NON-STANDARD CONNECTIONS. IF YOU HAVE ONE OF THESE PRINTERS, CHECK THE CONNECTIONS IN YOUR WORKING CENTRONICS CONNECTOR OR REFER TO YOUR PRINTER'S MANUAL FOR PROPER CONNECTIONS.

CONNECTIONS

TI OUT:

TI pin		Switch box term
1	to	1
2	to	2
3	to	3
4	to	4
5	to	5
6	to	6
7	to	7
8	to	8
9	to	9
10	to	Center of switch pole 1
11	to	16 (ground)
12	to	Center of switch pole 2
13	to	Not used
14	to	Not used
15	to	Not used
16	to	16 (ground)

A & B CENTRONICS PLUGS IN:

Switch Box term		Centronics
1	to	1A & 1B
2	to	2A & 2B
3	to	3A & 3B
4	to	4A & 4B
5	to	5A & 5B
6	to	6A & 6B
7	to	7A & 7B
8	to	8A & 8B
9	to	9A & 9B
A side SW pole 1	to	11A
B side SW pole 1	to	11B
A side SW pole 2	to	13A
B side SW pole 2	to	13B
11	to	Not used
12	to	Not used
13	to	Not used
14	to	Not used
15	to	Not used
16	to	16A & 16B & 17A & 17B

Centronics pins 18 through 36 are not used with ribbon cable. If round cable is used the pairs from 1 to 9 are connected to pins 19 through 28 and all floating pins are grounded.

I have been using this switch for more than a year. It works perfectly, every time. It is a little tedious to build but it does a great job, for very little money.

I accidently found that I can use both printers at the same time. I had been using the fastest printer and I started to use the other one. The switch was flipped just as the printer "ticked". Both printers worked fine. If it gets the BUSY from the slowest printer I can print two copies at the same time. I have no idea whether this will work with other printers but it works with my Brother HR-10 (LQ) and my Seikosha SP-1000.

PARTS:

Input cable: You can use your present cable and save the cost of the ribbon and two connectors. If you wish to keep your cable, I have several 16 PIN IDC Dual Inline Header Connectors with 0.1" spacing. (This is the small connector that comes from the RS-232 card.) The ones I have use the highest quality contacts (phosphor bronze, flashed with nickel, then totally gold plated). I also have some 38 conductor ribbon cable that can easily be ripped down to two 16s with a 6 left over. The connectors are $1.50 ea or 5 for $6.00. The cable is 20 cents per foot.
Dallas Phillips
Rt4 Box310 MtOlivet Rd.
LaGrange, KY 40031
(502) 845-7567 after 4:30pm.

The rest of the parts can be obtained from Radio Shack. NOTE: Several switches are listed. Select only one. I chose the one I used because of appearance.

Cabinet; Steel and Aluminum, 2 1/8"x3 1/4"x4".	Cat #270-251	$2.99
Centronics Parallel Connector; Male, w/solder connections. (Need 2 unless you use your cable.)	Cat #276-1534	$4.99
Switch; DPDT (I used this one.)	Cat #275-663	$3.19
Switch; DPDT	Cat #275-636	$2.99
Switch; DPDT	Cat #275-1546	$2.79
Switch; DPDT	Cat #275-614	$2.39
Switch; DPDT	Cat #275-625	$1.99
Terminal Strips;Phenolic	Cat #274-688	4/89c
Grommets;Pack of 35 asst	Cat #64-3025	99c
Machine screws; 6-32 Pack of 42, asst length	Cat #64-3010	99c
Nuts; 6-32, Pack of 30	Cat #64-3019	99c

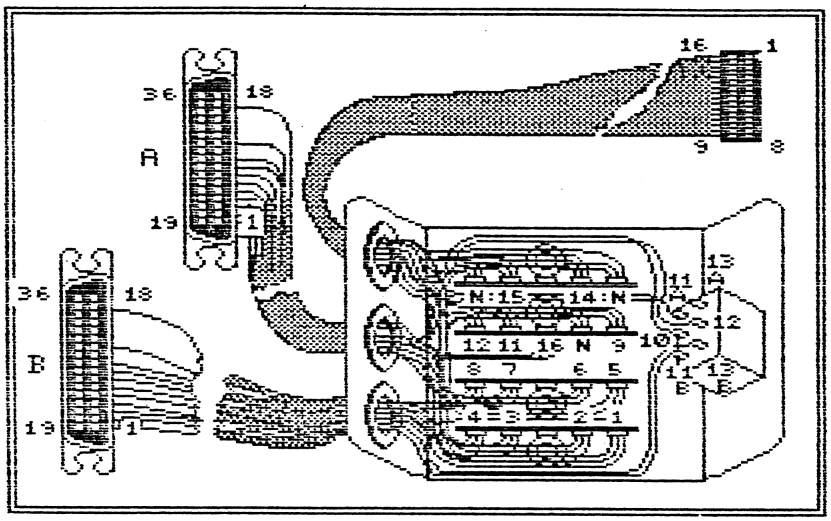
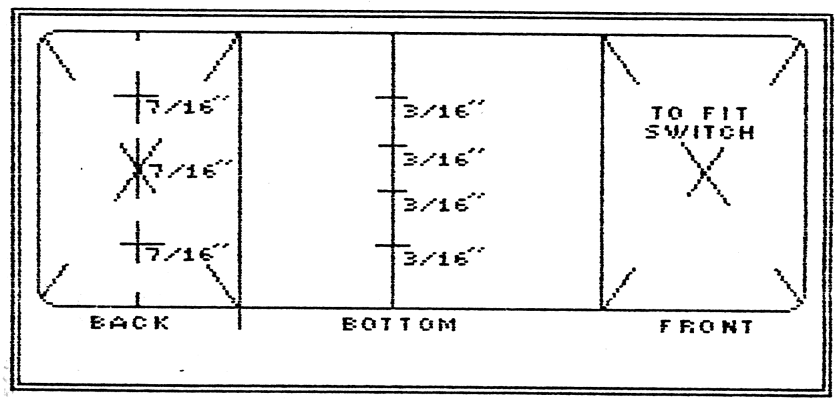


FIGURE ONE

FIGURE TWO



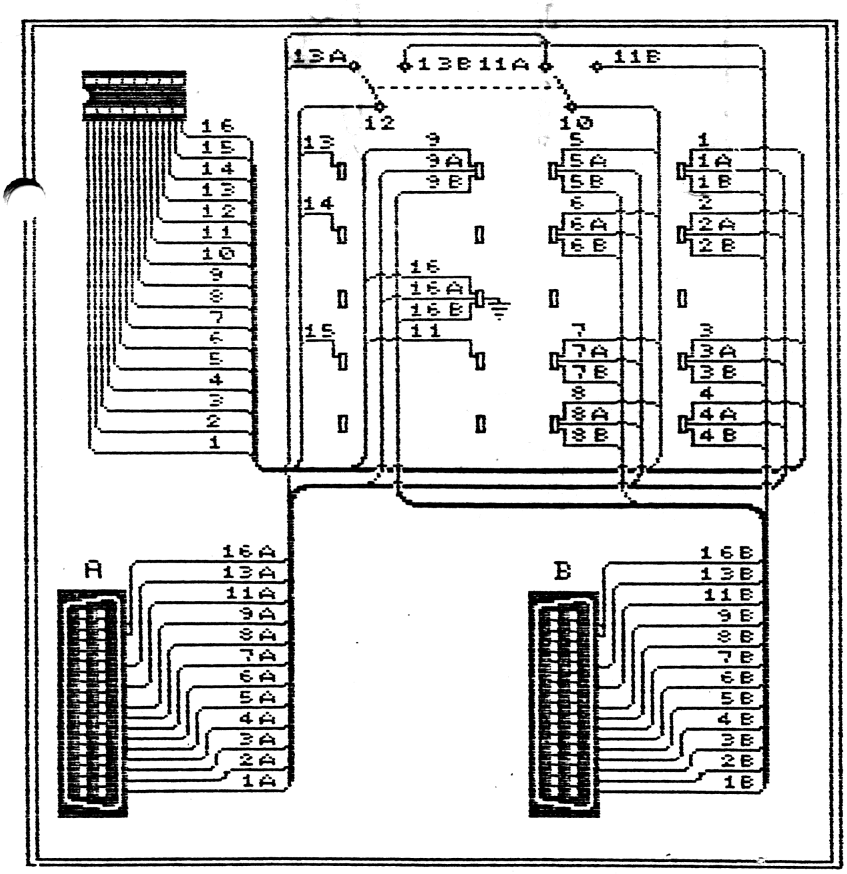


FIGURE THREE

BLUEGRASS 99 COMPUTER SOCIETY, INC. MEMBERSHIP APPLICATION OR RENEWAL

FIRST MI LAST

NAME _____ PHONE(H) _____

HOME ADDRESS _____ PHONE(W) _____

CITY _____ ZIP CODE _____

BUSINESS ADDRESS _____ OCCUPATION _____

CITY _____ ZIP CODE _____

PRIMARY INTERESTS _____ _____

DATE _____ SIGNATURE _____

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